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# Research excellence and evaluation using a CRIS: a cross-institutional perspective

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## Abstract

This paper describes the preparation of King's College London for the Research Excellence Framework (REF), a major UK research evaluation exercise. King's is a large multi-campus, multi-faculty institution, submitting to the majority of the REF Units of Assessment (UoAs). The preparation of REF data was substantially managed via a commercial CRIS system, Pure, developed by Elsevier (Atira), which was implemented in stages at King's during 2012-3. Both during the submission preparation and after completion, views were taken on the benefits and issues with the use of Pure for the REF across a wide spectrum of the College. The views of users are presented in this paper from different perspectives, including that of senior management, with an analysis of the differing behavior of UoAs across the College.

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## 1. Research Evaluation in the UK

### 1.1. History of Research Evaluation – Research Assessment Exercises

Within the UK, all Higher Education institutions wishing to undertake government-funded research are obliged to submit research data to evaluation exercises run by the UK Higher Education Funding Councils. The results of these exercises are used to determine a very sizeable proportion of the central government funding received by institutions, known as “quality-related” (QR) funding. The first such assessment exercise took place in 1986, with further

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exercises in 1989, 1992, 1996, 2001 and 2008. From 1992, each of these activities has been known as a “Research Assessment Exercise” (RAE)<sup>1</sup>.

Assessment is carried out at a discipline level, with institutions submitting information for individual Units of Assessments (UoAs), which generally map to departments within the university. For the past few assessment exercises the main factor in determining quality has been the research output produced by staff, mainly in the form of research publications. Other factors have also been taken into account when judging the research profile of Unit of Assessments; these have varied between exercises, but have included postgraduate student success rates, type and value of postgraduate studentships, value of externally won research awards, and various measures of wider research esteem, e.g. research prizes, editorship of scientific journals. These factors are generally grouped together under the heading of research “environment”.

Proportional funding levels in the years between assessments are based on the results of the previous exercise, and therefore can be fixed for as much as seven years. A poor performance in a single exercise can thus have a serious and long lasting impact on the financial health of any institution. A strong performance is also important to maintaining the reputation of the institution and in seeking a competitive edge over rival institutions, which naturally becomes intensified in times of increasing financial constraints around central funding.

### *1.2. The Research Excellence Framework*

Prior to the submission of data for RAE 2008, the UK government announced that this would be the final RAE, and that changes would be made to the way that research quality was assessed, with metrics forming the main approach to assessment. Based on this, the UK Higher Education Funding Councils in 2007 consulted with institutions on how this new process, the Research Excellence Framework (REF) might be taken forward. However, after feedback from this consultation and a pilot exercise examining the use of bibliometrics, it was determined that these measures alone were not sufficiently robust to form an accurate picture, but that they could be used as a tool to inform the established peer-review system of assessing research outputs.

A second consultation on the REF was carried out in 2009, noting that the REF assessment would now also examine the impact of research outside the academic sector. This would cover all aspects of potential benefit to the economy, society, public policy, culture or quality of life. A pilot exercise run by the Higher Education Funding Council for England (HEFCE) recommended that institutions should provide narrative case studies, evidencing how the research at the institution has been developed into tangible instances of impact.

The final guidance on submissions to the REF published by the UK funding councils<sup>2</sup> was that, like the RAE, up to four research outputs for each eligible member of staff would be nominated – staff deemed as early career researchers could submit fewer than four outputs without penalty – and that these would undergo peer review by expert panels. For the REF, however, this peer review would also be informed by limited bibliometric information, based on the number of citations that the outputs had received, but only in those subjects where such data was deemed to be sufficiently accurate. This assessment of research outputs would form 65% of the overall weight of the final assessment outcomes. Some environment data was also required for the submission, indicating completed postgraduate student numbers, and the value of external research awards. This would form 15% of the overall outcome. A number of impact case studies were also required, based on the number of staff submitted to the UoA, and these would form 20% of the final outcome.

## **2. Research Evaluation at King’s**

### *2.1. RAE2008 and the Research Gateway*

The RAE of 2001 at King’s was run substantially as a “paper” exercise, where information gathering took place in isolation in departments, and the main method of data handling was via spreadsheets, which were transferred between staff via email. In 2004, therefore, the then Vice-Principal for Research formed a group to consider the implementation of a “research database”, which would, it was expected, hold information relevant to the following RAE exercise. An evaluation of potential commercial options indicated that no system met the requirements of the College at that time, and so a system was developed in-house, known as the Research Gateway (RG). The RG was

developed as a rudimentary CRIS system, where data from HR, student and finance systems was imported and linked together. Data on research publications was also imported from the Thomson Reuters Web of Knowledge (WoK) publication database, with a facility for manual entry of any publications not available in that database, e.g. books and book chapters.

After submission to the RAE, many staff felt that the RG had fulfilled its role of completing the RAE submission, and was therefore of little further use. Although work was carried out during 2008 to 2010 to enhance the features of the system, including the development of research staff profiles for the external website, this development was constrained by the limited resources available and meant that usability issues noted by many staff were not able to be addressed sufficiently.

## *2.2. Implementing Pure at King's*

In late 2010, a re-evaluation of possible commercial CRIS systems was undertaken. It was noted that the landscape had changed significantly since 2004, with several commercial tools either in place or under implementation in the UK. In early 2011, the College created a new Research Management Directorate, and this led to the engagement of the Danish company Atira to implement their CERIF-compatible Research Information System (Pure) at the College to replace the Research Gateway.

The implementation of Pure at King's commenced in mid-2011. Like the RG, Pure was also set up to import data from the other College business systems. The decision was also taken to use the Research Portal functionality of Pure to replace the (RG-linked) research staff profiles, with work on this aspect starting in January 2012. To ensure that the effort involved in populating the RG was not lost, all the research output information from the RG was imported into Pure, along with information on research activities.

A working version of Pure was released to the College in June 2012. Awareness of the system amongst academics was raised by offering 15-30 minute presentations at departmental and research group meetings, to emphasize that Pure should act as a tool for on-going and everyday use, rather than a system that was only aimed at completion of the REF submission. These presentations ran between June 2012 and Jan 2013, and despite the considerable workload required, were seen as more appropriate than launch "events", where the audiences are substantially made up of staff with a particular interest in the system.

Development of the external web Research Portal suffered from data quality issues, and was not finally released until June 2013. One consequence of this, resulting from infrastructure constraints, was that users could not directly access the Pure backend interface from outside the College until the release of the Portal.

The version of the Pure software at launch included a module specifically aimed at assisting with REF submission. Initially this REF module allowed the construction of UoA groups, the ability to mark the eligibility and submission status of staff, and also allowed individual staff (or administrators) to nominate research output to be considered for submission. Later, the ability to provide citation information for research outputs was included, plus the ability to grade the perceived quality of research outputs once they had been reviewed. Over subsequent releases, enhancements were made to this module to allow impact and environment information to be collected, and this meant that, several months before the submission deadline, all the required information for the REF could be included in Pure. Functionality was also available in this module to allow direct upload of all data to the online HEFCE REF submission system.

## **3. King's approach to the REF**

Immediately following the release of the REF guidance on submissions, King's started to make it's preparation for the REF. A REF coordination group was set up, chaired by the Vice-Principal for research, and including the Vice-Principal for the Health Schools and the Vice-Principal for the Arts and Sciences. The main tasks in planning and coordinating the REF submission were carried out by staff in the Research Management Directorate (RMD), led by the Director of Research Policy and Operations and her staff. The central support team was a relatively small group, with two administrative staff seconded from within the College carrying out the bulk of the work, aided by members of the Research Information Systems team. Research output checking was carried out by the Digital

Assets team in the Library, and support and expertise on bibliometrics was provided by a Research Information Specialist from the Library, whose main role during this time was to support the REF.

The Units of Assessment that King's would submit to – 27 in total – were agreed with Schools early in 2012, along with the staff coordinating the submissions for each UoA. Each UoA had at least one academic lead, and an administrative lead was also identified for all UoAs, although these administrative staff often worked across multiple UoAs. The administrative leads of the UoAs along with members of RMD and representatives from other professional services areas, including HR, IT and Library formed the REF Support Team which met monthly during 2012 and 2013 to review progress. Departmental or divisional administrative staff also assisted the lead UoA administrator, as in a number of cases one UoA spanned a number of departments/divisions. A College academic lead was also appointed to oversee the development of impact cases studies. As impact was a new aspect to REF, this process was started earlier than other data collection, and for some UoAs, external agencies were engaged to assist with authoring cases studies.

During 2012 and 2013, each UoA gathered information on staff research outputs. All UoAs engaged in some form of review and scoring of research outputs, either internally or with the assistance of experts from other institutions. This information was entered into Pure once the system had been released. Specific environmental data on research grant income and postgraduate awards was gathered by the central team, and was distributed to UoAs for checking. This information, along with completed impact case studies, corroborating evidence for case studies, and textual environment statements created by each UoA were uploaded to Pure during mid 2013.

To ensure that UoAs were on track to submit on time, the Vice-Principals ran three “dress-rehearsal” exercises, at which the quality of each UoA submission was reviewed. The data in Pure was used to judge the preparedness of the UoAs. Most UoAs needed only to attend the first exercise in July 2013, but the larger UoAs and those where issues with the submission had been identified, were reviewed again in September and October.

Data was uploaded to the REF submission system directly from Pure regularly during October and November by the central team. UoAs were asked to ensure data on the submission system was correct, but no access to the submission system was granted to UoA staff, as all corrections were required to be made in Pure. The final submission of data was made one week before the final REF deadline.

#### **4. Surveying the use of Pure for REF submission**

A number of methods were used to gather the views of staff on the use of Pure, both during and after the REF exercise. During the preparation of the REF submission, informal feedback was regularly sought at meetings of the REF Support Team. Feedback was also forthcoming from UoA academic leads and the Vice-Principals after the three REF dress rehearsal meetings, although these meetings were primarily to discuss the academic quality of the submissions. An email helpline for queries relating to the use of Pure exists, which is available to all Pure users, and traffic on this during the REF submission has also been examined to determine if any common queries or trends were visible from these support requests. The central REF support staff made extensive use of Pure during the submission, and made their views known – either on their own use or that of others around the College – throughout the process.

Following the completion of the REF submission, more formal feedback has been gathered on the use of Pure for managing the REF process. A general REF survey was sent to Schools and departments, which included questions on the usefulness and quality of Pure in supporting the submission. The responses to this survey were in the main part completed by UoA academic leads or Heads of Department, who aimed to give a perspective of the REF process across the whole UoA, although personal experience was often also quoted. Finally, several semi-structured interviews were held with selected staff from across the College in particular support areas. Members of staff acting in central REF support roles were interviewed, and these included the College Vice-Principal for Research. Other interviews were held with staff from across all the UoAs; the interviewees chosen were members of the REF Support Team, who were, in general, the biggest users of Pure outside the central team, but who also had regular exposure to the views of individual academics and to local UoA academic leads, and Heads of Schools or departments. Included in these interviews were some questions asking about the experience in selecting and managing information for REF – including that relating to impact and environment – within Pure, plus others about the general usage of Pure within the relevant department and the usability of the system in general. Staff were also

asked about what features in Pure were most useful, and where improvements could be made to the functionality. Finally, questions were also asked relating to the wider impact of Pure, and how Pure could be used in the future. Interviewees were invited to be candid about their experiences, and to include details of poor experience and practice as well as more positive comments.

## 5. Survey Results

### 5.1. *Perspective 1 – the Vice-Principals*

Pure was seen as providing an “enormous benefit” to the REF submission by the Vice-Principal for research, and he considered the investment in implementing the tool very much worthwhile. It was seen as a significant improvement on the RG, which was seen as requiring far too much user intervention. All the Vice-Principals actively used Pure throughout the REF process, and it was noted that their use of the system encouraged the use by other REF leads. An existing recommendation to academics that publication information should be held in the central system was strongly reinforced by the Vice-Principal for research once it was deemed that Pure was stable enough to be used for that purpose. Furthermore, for the REF dress rehearsal exercises, it was made clear by the Vice-Principals that judgments would be made on readiness for submission based solely on the data that was recorded in Pure.

Pure was deemed to be relatively easy to use by the Vice-Principals, even when using smaller screen devices. All features of the REF module were used by the Vice-Principals on a regular basis, and all were deemed to be worthwhile, with no strong desire for extra features. Possible improvements which were mentioned were the ability to cross-check for publications submitted to the previous assessment exercises, and functionality to ensure that multi-authored papers were being allocated appropriately to maximize the benefit to the submission.

There were differences in opinion between Vice-Principals on the benefit of citation information in Pure. The Vice-Principal for the Health Schools wished to make considerable use of citation information to judge the quality of the outputs, but other Vice-Principals were more cautious. They considered them useful as a benchmark for ensuring that scores from external or internal review of outputs were not “skewed” or inconsistent, in keeping with the planned use of this information by the actual REF expert panel members. All agreed, however, that the upload of citation data into Pure, which happened in June 2013, was too late, meaning that the benefits from using the information for any purpose could not be fully realized.

The general assessment of the Vice-Principals was that King’s actually made a better submission to the REF because of Pure. This was based on the recognition that the process was much more transparent than previous similar exercises, with greater clarity on the overall nature of the submission. This allowed instances where process was not being followed to be recognised and rectification to be carried out; in several instances, this strengthened the UoA submission by the inclusion of staff who might have otherwise been overlooked.

The Vice-Principal for research expressed a belief that too much data recording and measurement outside of the REF periods would be actually be detrimental to the research activity and for this reason, contrary to many others, he believes that impact information should not be regularly recorded in Pure. He noted, however, that other Vice-Principals do see some role for Pure in carrying out internal assessment between REF exercises. The expectation from the Vice-Principals is that Pure will play an even greater part in the next REF submission.

### 5.2. *Perspective 2 – the REF central support team*

The staff in the REF central support team were the most extensive users of the Pure system, with data entry and report preparation a daily task for these staff. Their view of the Pure system was very positive, and they remarked that their roles would have been very difficult to perform without having such a system. The team agreed that Pure was generally quite easy to use, and those members of the team who had used the RG for the RAE submission agreed that it was much simpler than the RG. The parts of the REF module that these staff found most useful were those relating to people and publications, and there was particular appreciation for the UoA overview screens in Pure, which showed a summary of all the information to be submitted for each UoA.

Central support staff made extensive use of reports in Pure. In most cases, these were deemed reasonably easy to create. The main type of reports used were those which monitored the progress of UoAs in completing particular steps towards submission, e.g. decision on staff "pending" submission, number of publications nominated, scored and confirmed for submission, upload of impact case studies. This allowed much better control of the overall submission, with the ability to spot where certain UoAs might be in danger of missing deadlines, and dealing with such issues in a timely manner. However, it was noted that parts of the process in Pure for confirming data were somewhat overcomplicated and that this led to staff in the UoAs occasionally being less careful with checking than desirable, simply to get the process finished.

Another aspect of the system particularly appreciated by the central team was the integrated nature of Pure, so that, for instance, data for REF could be automatically fed through from the HR system, and that, if this data was incorrect, data changes made in HR would be updated also for REF. Alongside this, the ease of navigability of Pure was noted, aided by the inherent interconnectivity of the underlying data.

One area of the system which certain staff found more problematic were the screens for dealing with environment data. One of the major problems with these was that data was required for people no longer working at the College, and this data was not therefore visible to the UoA administrative staff. Also, reports were much more difficult to generate for environment data, meaning that the final collation of this data was completed much later than for other REF data. Improvements to these screens were the major improvement that central staff would like to see. The only other issues noted with data recording for REF were some difficulty in recording the information which would be used for corroboration of the impact case studies, although it was noted that, because this was recorded quite late, the issues may have been down to a lack of familiarity with that functionality.

The use of Pure for the submission process was seen as somewhat easier than expected by the central team, noting that there was "not very much we couldn't do". The ability to upload all data via a "single click" to the REF submission system was seen to work well, and meant that staff had confidence that what was in Pure was what would be submitted. Although staff were not sure whether the use of Pure would result in the overall submission receiving better assessment results, it was agreed that its use has probably resulted in fewer errors in the submission. The expectation from all the central team is that even more use will be made of Pure for the next REF submission, especially as individual academic staff start to engage with the system.

### *5.3. Perspective 3 – Library staff*

Library staff had been involved at all stages during the implementation of Pure, partly as the system also fulfils the role of a full-text publication repository, and continued to play a role in checking and validating research publication information being automatically uploaded and entered by Pure users.

Overall the users from the library found the system reasonably easy to use, and it was noted that temporary members of staff recruited for REF did not take long to become accustomed to using the system. Like the REF central team, they considered that it would have been difficult to perform the tasks for submission without a system like Pure. The processes in Pure for ensuring research output was fully checked before being submitted were seen as appropriate by the library staff, although they believed that communication issues led to a breakdown in the way they were used in some areas.

It was noted that Pure does not use "library jargon", which results in users finding it relatively easy to enter publication information. The main information that library staff needed to add to REF records was a Digital Object Identified (DOI); this was mandatory for submission where it existed, so that REF panel members can more easily access electronic versions of submitted research output.

Much of the library team's work was done on screen, but it was noted that reporting in Pure for library staff, e.g. for monitoring numbers of publications still requiring validation, was not as sophisticated as for many other Pure users. Another issue encountered was the need to validate more unusual forms of research output, e.g. web sites and datasets, which some library staff felt rather unqualified to perform. There were also some minor concerns that the library staff were not included in the process for REF data checking quite early enough and that a little more information on the REF requirements in general would have been useful.

For the next REF exercise, HEFCE has already indicated that there will be a requirement for any publications submitted to the REF to be available in an "open access" form. While the library staff welcome this



recommendation, they note that this will require a change in culture from academics, and potentially an even greater need for library support for staff who are not clear on the requirements for open access publication.

#### 5.4. Perspective 4 – Units of Assessments

Following analysis of the views of the Schools based on REF feedback and interviews with key staff, the charts in Fig. 1 show the views of the various UoAs to some broad questions about the performance and uptake of Pure across the College. Views are "weighted" by the size of the UoA submission (rather than by number of respondents); where views within a UoA differed, these have been averaged, but in general views of Pure within each UoA have been very similar.

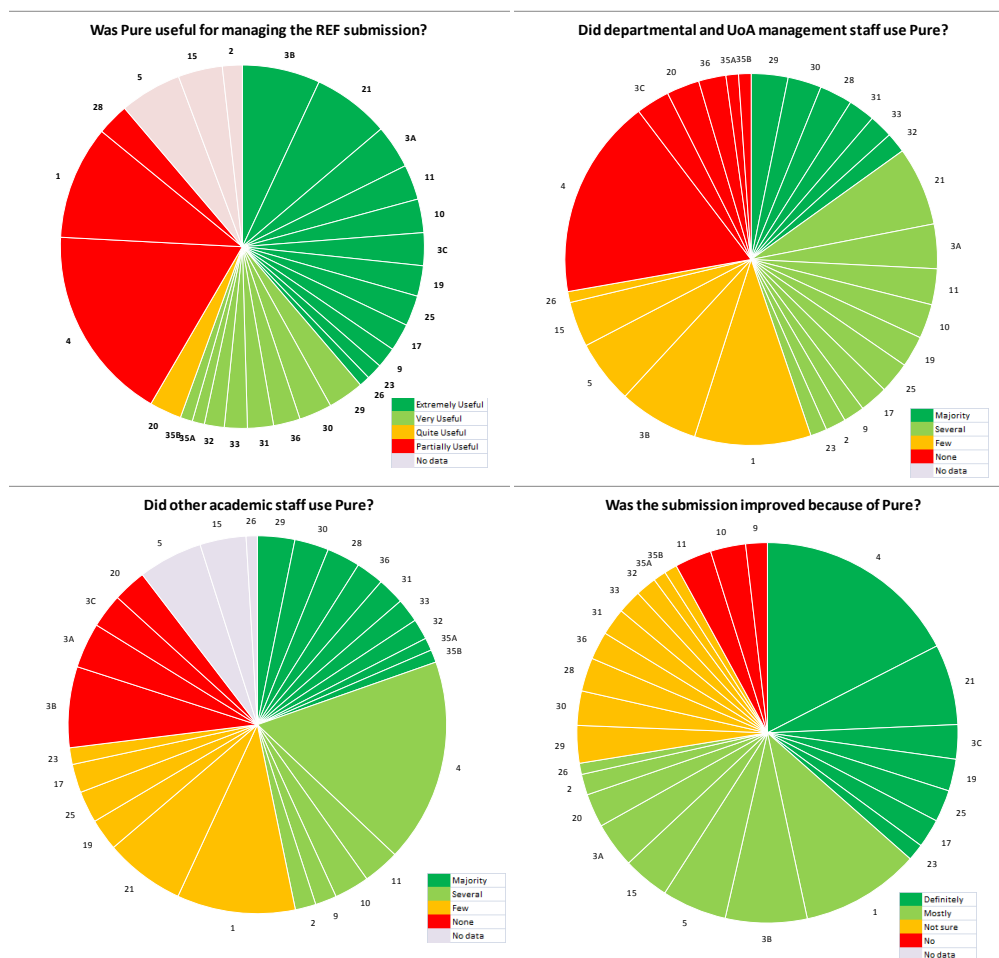


Figure 1. An analysis of the views of UoA staff to broad questions on the role of Pure in carrying out the REF submission. Details of UoA numbering can be found in Reference 2. Multiple submissions within the same UoA at Kings were as follows: 3A – Dentistry; 3B – Pharmacy and Nutritional Sciences; 3C – Nursing and Palliative Care; 35A – Music; 35B – Film.

A strong view, expressed by the majority of respondents, was that Pure was implemented a little too late in the REF process to provide maximum benefit, and that this meant that a considerable amount of data (including the scores from the reviews of outputs) was collected initially in spreadsheets. Views on the main benefits and issues with Pure experienced by staff in the UoAs are summarised in the Table 1.

Table 1. Main benefits and issues with the use of Pure for REF (items are ordered by the number of times mentioned by respondents)

Benefits	Issues
Integration with other business systems	Poor functionality for recording/viewing environment data
Ability to easily monitor/control progress of submissions	Scoring of outputs was done outside of Pure
Single summary pages showing overall UoA submission information	Creating reports was problematical
Having a single place to store all the REF information	Pure was implemented too late
One authoritative source of data	Process for confirming submission data was too complicated
Interconnectedness of information	No method for recording “borderline” scores for research output

## 6. Conclusions

The use of Pure for the REF submission has been seen by all respondents as a benefit to a greater or lesser extent, and certainly as a vast improvement on the previous Research Gateway system. A number of staff remarked that they could not imagine how the College’s REF submission would have been completed without Pure, and it seems that there is recognition across the College that trying to perform a REF submission across an institution the size of King’s without a sophisticated CRIS system would now be virtually impossible.

Because of the need to record all REF data in Pure, all administrative staff used the system extensively. The main reasons for UoA leads and other local managers not using Pure seem to come down to two main reasons, which were the relatively late implementation of the system, meaning that extensive work had been conducted outside Pure, and cultural issues where staff were uncomfortable using technology in general. In the largest UoA, however, the biggest hurdle to using Pure appears to have been the lack of sophisticated modeling functionality to handle the large number of publications in that UoA with multiple King’s authors.

The inclusion of a specific REF module within Pure was widely appreciated, and the specific functionality for managing people and publications within this has been seen as extremely useful. There was, however, a view that the tools for dealing with environment data will need to be improved if they are to be useful in the next REF exercise. Other factors that have been seen as particularly beneficial relate more to the inherent CRIS nature of Pure, which are the interconnectivity of the data within the system – the ability to “click-through” from publications to people and vice versa – and the fact that the integration of Pure with other business systems means that, for instance, relevant HR data is automatically included in the submission.

While use of the system by the wider academic community was patchy for this REF exercise, it is generally believed that this will increase considerably for the next REF. Interestingly, there has been an uptake in the use of Pure since the REF, as academic staff have been encouraged to ensure that their web profiles are consistent with the information provided to REF assessors in terms of impact and environment statements. There has also been some recognition, with the notable exception of the Vice-Principal for research, that more extensive tools for recording evidence for impact would be useful for academic staff, even if this is something as simple as “pin board” tool for adding short notes or documents.

Although promotion of the use of Pure continues to be carried out by staff within the Research Management Directorate, there is early evidence that the use of Pure is becoming a standard part of an academic’s workload, and will soon no longer be seen as an added burden. This, plus some minor improvements in functionality, should allow the College to benefit even further by using Pure for the next REF assessment.

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